

DOW CANADIAN

April 1980

INSIGHT

EDITION

AR51



"Feed me!"

That's what this issue is all about. Mankind's greatest challenge in the decades ahead.

- A plea for balance (pg.3)
- Fifty-six scientists agree: 2,4,5-T is safe (pg.7)
- Risk and other four-letter words (pg.14)
- Business and the media (pg.15)
- Do we know what we are doing? (back cover)

Contents

April 1980
Volume 3, Number 1

- 1 Letters
- 2 Bulletin Board
- 3 A plea for balance — *by Mary Porter*
"Farm people must spend less time producing and more time and effort protecting the right to produce."
- 7 Fifty-six scientists from eight nations agree that the herbicide 2,4,5-T is safe — *Staff*
"Good scientific judgement depends on a clear understanding of the nuances and subtleties of research."
- 11 2,4,5-T . . . Another decade of controversy?
— *by G.R. Stephenson, Univ. of Guelph*
"What are the reasons for this? What are some of the questions? What are some of the answers?"
- 14 Risk and other four-letter words
— *by Walter B. Wriston*
"Today, we all live in Marshall McLuhan's global village and Chicken Little runs through the square twice a day."

LETTERS

Tax index attacked, Fraser institute responds

Your article on the "tax index" in the August 1979 issue provided a shallow and misleading assessment of the tax increases of recent years. Taxes are levied to pay for goods and services which are not efficiently supplied in the market system — such as health care, highways, defence, police, courts, education, and income security. The "consumer tax index" you report simply measures changes in total spending on these activities.

If Canadians generally wish to consume more of these public goods and services, it is natural that the "tax index" will rise more sharply than the indices of expenditures on such privately purchased goods as food or clothing. There is nothing inherently wrong or disturbing that with increasing prosperity people should choose to allocate much of their income gains to consumption of public goods. Indeed, if governments were to cut back on the supply of a public service such as health care, households would doubtless increase their private expenditures on health care. Judging by American health care costs, it seems likely that Canadians would have to spend more for health care if this were in the private sector.

It should be clear that the "consumer tax index" is comparable to expenditure indices for private goods and services but cannot be compared in any sensible way with the consumer price index. If the Fraser Institute wanted to contribute positively to the assessment of taxes and public spending, it would construct indices of the (per-unit) costs of the various goods and services supplied by the public sector. These would be more directly comparable with the consumer price in-

dex. Such public-sector cost indices would tell us whether we as consumers are facing greater or lesser inflation in the price of obtaining public goods and services. Admittedly, this kind of index would be more difficult to assemble than the mechanical exercise behind the "tax index".

A major portion of the increased public spending, and hence tax burdens, of recent years has been due to expanded income security programs. Old Age Security, Guaranteed Income Supplement, Canada Pension Plan, Family Allowances, and Unemployment Insurance transfer incomes to relatively needy groups in the population. Since the funds are transferred at modest administrative cost, it seems misleading to include them in a "tax index." While these flows are taxes for some households, they are income receipts for other households. Hence, if the "consumer tax index" is to be a measure of the financial burden of governments on households, it is only logical to net out income security payments. Making this adjustment, we would find the "tax index" rising less sharply between 1961 and 1978 than reported by the Fraser Institute.

Jonathan R. Kesselman, Assoc. Prof., Economics, Univ. of British Columbia

(Ed. Note: At our request, the Director of the Fraser Institute, Michael A. Walker, responded to Kesselman's criticism. Walker's and Kesselman's comments are printed here without editing. The Fraser Institute recently published the book "Tax Facts: The Canadian Consumer Tax Index And You", excerpts from which appeared in our August 1979 issue.)

* * *

Michael Walker writes...

Noting that people's opinions are their most valuable possessions, I will be temperate in my comments.

1. The tax index does not measure total spending, it measures the average family's total tax payments — what the average family paid to government for the services it received from government. How government spent the money and how much benefit the individual family received is quite a different question. The objective of our work is to ascertain how much of the average family's working income — total ability to choose — is taken from it by government. Only individual families can know whether or not they get what they paid for.
2. The second paragraph in Kesselman's letter displays a complete ignorance of recent Canadian history. The increase in taxes which occurred in the early 1970s was not, by and large, legislated. Canadians were not given a choice; they did not, in Kesselman's words, "choose to allocate much of their income gains to consumption of public goods". Until 1974, their choice was usurped by the progressive income tax interacting with incomes swollen by inflation. After 1974, it was usurped by deficit financing which is currently one of the federal government's larger sources of finance.
3. Most Canadian families are not aware of the total price they pay for government services, in the sense of the total cost, since about half the tax bill is hidden in one way or another. (income taxes, for example, account for only two-fifths of the tax bill.) It is meaningless to talk about people *choosing* public goods and services when, in most cases, they don't know the cost. And, as Proposition 13 in California has recently demonstrated, as people discover the cost of government, they

Continued on page 17

15 Business and the media

— by James P. Gannon

"The journalist is coming at the story with an entirely different mental framework and different goals than the businessmen..."

19 Editorial: Do we know what we are doing?

— by E.L. Weldon

"... the basis for decision should include a cost effectiveness study."

Cover: To us, this youngster's expression and expectant attitude symbolizes our world's greatest future obligation: the pressing need to produce ever greater quantities of food and fibre to adequately feed, clothe and shelter succeeding generations. Growing populations, badgered by zero-growth and zero-risk zealots, may wind up starving or freezing in a pristine environment. Knee jerk reactions to doomsday predictions, often "politically" inspired, serve more to defeat man's drive for responsible environmental safety than to preserve it.

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BULLETIN BOARD

Research medal winners typify tradition that creates stream of new products, processes

In 1979 Dow honored six of its top research scientists for their achievements. The six were awarded the newly-struck Herbert H. Dow Medal as "rare individuals whose inventiveness and pioneering in technology have had outstanding impact on The Dow Chemical Company and society." The six: **Robert G. Heltz**, developer of the first commercial thermal process for making perchloroethylene, as well as the hollow fiber technology that led to desalinated water units and artificial kidney machines; **Howard Johnston**, who developed a family of agricultural chemicals including N-Serve* nitrogen stabilizer; **William C. Bauman**, world authority on ion exchange, whose inventions led to the development of Dowex* ion exchange resins and other major Dow products; **Ray Rigterink**, expert in the synthesis of heterocyclic molecules, whose work paved the way to such products as Coyden* coccidiostat (for control of the disease in broiler chickens) and a number of insecticides; **Louis C. Rubens**, expert on polymer foams, who developed the technology for certain expanded polystyrene foam products, Ethafoam* expanded polyethylene, and composite foam systems; **Carl B. Haven**, expert in film manufacturing technology, the developer of Handi-Wrap* food wrap film and other film products.

Herbert H. Dow, the company's founder, was a prolific inventor who obtained 64 patents during his lifetime. A 1968 study ranked Dow first among large U.S. industrial firms both in number of patents per \$100 million in sales and patents per 10,000 employees. Repeated in 1973, the same study again showed Dow first in patents per sales dollar (150.2 per \$100 million sales) and a close second in patents per employee (92.6 per 10,000 employees). Canadians contributed proportionately to these records.

But the number of patents can be misleading. **Lawrence L. (Zip) Ryden** was granted only 5 patents during his Dow career but is remembered as the inventor of latex paint. **O.R. McIntire** has also had only a handful of patents during his Dow career, but among them were basic patents for Styrofoam* brand plastic foam insulation and high impact grade polystyrene resin.

Dow's bird record wins Audubon award

The Houston (Texas) Audubon Society recently presented its annual Civic Achievement Award to Dow's huge Freeport, Texas, plant for its work in maintaining the quality of the environment in that area. More than 130 Audubon Society members spent a day last December identifying and counting species of birds around Freeport. Result: 217 different species in the single day's work. Said David T. Dauphin, a director of the donor group, when presenting the award: "I hope you are all very aware of the fact that within the fifteen-mile diameter circle we have just birded in lies also one of the world's largest chemical complexes, Dow's Texas works. The simple fact that this count ranks so high for the number of bird species seen and the number of people that participate in the Freeport Count says a great deal, in itself, for Dow's concern with maintaining a quality environment in this area. A major shrimping fleet, two national wildlife refuges, ranches, farms and thousands of people depend on Dow to protect and, I believe to improve this area's environment. Dow has indeed met that challenge."

Scientists charged with crying wolf in cancer scares

Public anxiety over which substances can cause cancer is heightened by misleading and inaccurate scientific reports, the editor of the **Journal of the American Medical Association** said a few months ago (in an editorial). Dr. William Barclay said government agencies (in the U.S.) in particular often issue scientific findings to create drama and justify their existence. He cited a recent National Cancer Institute report that reserpine, a drug used to treat high blood pressure, caused cancer in mice and rats. "If you took time to read the report, you'd be puzzled as to how in hell they came to the conclusion this drug causes cancer," Barclay said in a later interview. "If people took those headlines at face value and stopped using the drug, some would suffer strokes and some would suffer heart attacks. It is incumbent on government to exercise extreme care in analysis of these studies, to submit the reports to careful scientific peer review, and to be certain that any interpretation of the reports to the lay press accurately reflects conclusions that the data can support," he said.



A plea for balance

“Farm people have learned they must spend less time producing and more time and effort in protecting the right to produce.”

by Mary Porter

I assure you that speaking before this distinguished group is a great change from my usual routine of doing farm work and representing farmers of my state through Farm Bureau.

As you heard, we're dairy farmers.

Our farm is now worked by three generations of Porters.

Grandmother Porter does the farm bookkeeping...

Two of my sons, Wilbur and Douglas, my husband, and our son Mike, operate the farm.

I help out when I can, but much of my time is now taken up with Farm Bureau.

It is our sincere hope, if the kind Lord is willing, that succeeding generations of Porters will find it possible to continue to keep the family farm productive.

Not too many years ago, our main challenges were of an economic nature. Along with all other business people, the bottom-line figure must be favorable if we and other farmers are to stay in business.

These economic challenges continue. They are led by double-digit inflation and a growing cost-price squeeze.

Producers burdened

But a host of new political, social, regulatory, and educational problems have been added to the burden of every food and fiber producer in this country.

That's where Farm Bureau comes in.

Farm people have learned they must spend less time producing — and more time and effort in protecting the right to produce.

Before expanding on that, perhaps I should pause to explain a bit about Farm Bureau.

We're a voluntary organization made up of 3,076,000 farm and ranch families living in 49 states and Puerto Rico.

In each of the past eight years, Farm Bureau has grown by more than 100,000 additional member families. More than 85 percent of all farm and ranch owners and operators are members of Farm Bureau.

We have offices in each state except Alaska and in most of this nation's counties.

I'm trying to impress you with numbers. I recite these figures to show U.S. Farm concern, and farmer cooperation in realistically facing this concern here in the United States.

We are terribly concerned about regulatory encroachment on our right to manage our food production businesses.

As the nation's most productive people, we are discouraged by bureaucratic disincentives to farm production which appear to spring up faster than summer weeds.

Rather than being praised for our productivity, we are harassed by no-growth advocates.

We are heartsick about the slowing and discontinuance of meaningful new research, inhibited (or prevented) by political and social pressures.

As a fluid milk producer, I'm very much aware of the need for health regulations. Along with all other dairy owners, we willingly comply on a regular basis with a long list of federal, state and local on-site inspections.

Are they necessary?

But to assure that there is a good supply of clean, healthful milk, we must control pasture brush and get rid of weeds, in fields and elsewhere. Many of these weeds are poisonous. We must kill insects of all kinds, keep our animals disease-free and healthy, and inhibit bacteria from start to finish in the milking and milk-handling process.

To do these things economically so that people can afford to buy milk, we must use a long list of modern chemical tools.

Some of these chemicals may involve substances no more uncommon than iodine, or a household detergent. But some of the chemical compounds we find essential may be as complex as the herbicide 2,4,5-T for pasture brush control, or an antibiotic needed to cure mastitis.

Farmers don't really appreciate having to pay for these costly substances and spend all that time and effort in using them. We would be pleased if there were simple solutions to bacteria and bugs, but it just isn't feasible to sterilize cows and barns with live steam.

We would prefer to kill weeds with cornflakes or charm the mosquitos with

Chanel Number 5, but those things don't work. There are some gains to be made in the direction of biological pest control, and some day these methods may be sufficiently effective.

Meanwhile, we have to get rid of the poisonous plants, the botflies, the faceflies, the black flies, the horse-flies, the disease-carrying farm flies, and mosquitoes and all of the rest — and do it right now.

As practical people, we react negatively to sweeping solutions offered by regulatory zealots that are as impractical as comedian Will Rogers' suggestion for getting rid of the U-Boats during the First World War.

Said Rogers: "It's simple. Boil the Atlantic Ocean, the submarines will bob to the top."

When asked how it would be possible to boil that big ocean, Rogers reminded his audience that he dealt only with policy, not with operational problems.

Recently a healthy, knowledgeable, outdoorsman walked away from civilization to make his living directly from his own efforts out in the woods.

He emerged about a month later in fair health, but quite exhausted. He reports it

is possible for a person to live off the land without an extensive infrastructure, without machinery and manufactured chemicals and so on. But, he adds that it takes tremendous effort to get just enough to eat, that a person is always hungry and the thought of food is constantly on a person's mind.

Some branches of our U.S. Armed Forces offer survival training courses for select personnel. These courses prove that people can survive under some very primitive conditions. Few of us would volunteer for this experience.

Grubs found under a rock or in a hollow log can be quite nutritious — and they provide a large part of the protein diet for many people the world over.

But most Americans become emotional upon finding a live mouse in a flour bin or even a dead bug in the berries.

No sense of balance

It is interesting how hard the very people who sing the virtues of unvarnished nature, work to avoid that which they romanticize.

We have lost our sense of balance when dangerous, raw, plant compounds, many of them highly toxic, (although most people may not know they are toxic) can



Spraying pesticides on potato plants this way invites exposure and drift problems. High pump pressure and improper nozzles creates unnecessary spray cloud, wastes pesticide, allows farmer to breath vapors all day. Proper mask and gloves recommended by pesticide manufacturers should be employed.

Mary Porter is president of the Connecticut Farm Bureau Association. The Porter family are third generation dairy farmers. Mrs. Porter opened the Scientific Dispute Resolution Conference on 2,4,5-T in Arlington, Virginia, in June of last year with these remarks. Fifty-six scientists from eight countries took part in the Conference which was sponsored by the Research Foundation of the American Farm Bureau Federation. Results of the scientist's deliberations are provided elsewhere in this issue.

be openly sold in health food stores, even as farm people are denied the chemical means to kill poisonous plants which grow at fieldsides and in pastures.

Self-medication through use of old herbal recipes, can be extremely dangerous. These herb remedies are in vogue among those who turn their backs on modern chemistry as potentially harmful. In turn, they place their trust on "natural" substances, old-time remedies, without having the old-fashioned wisdom to go with it.

As a result, fatalities are reported from the unwise use of natural compounds about which very little of scientific nature is known. So-called "health food" stores are filled with compounds such as chamomile tea, licorice, poke-weed, and pennyroyal oil.

Pennyroyal is meant for external use, but has a reputation as an abortion agent. Recent deaths have been reported in the cases of women who took a single spoonful internally.

Licorice, either the root or the candy made from it, can contribute to high blood pressure. Many people use all parts of the poke plant as a salad green, but under certain circumstances, all of it can be fatal. Chamomile tea can cause severe reaction in people who suffer from certain allergies.

I repeat: we have lost our national sense of balance when, because of faddist acceptance, toxic, dangerous, raw plant compounds can be offered to the public under the guise of health foods, while highly tested chemicals are branded as potentially unsafe.

Protected can kill, deform

The suspension of the chemical weed killer 2,4,5-T — because of possible, or perhaps "potential" is a better word, potential involvement in miscarriages — ironically now allows the unchecked growth of hundreds of poisonous plant species with proven abortive abilities.

Nettle and other high nitrate weeds will cause pregnant cattle to abort anytime between the third and ninth month of pregnancy.

A half-ounce of the root of a water hemlock plant will kill a grown cow. Lupine will cause deformed lambs, born with "cyclops" head with one eye, with deformed legs and spine.

Bracken fern, when eaten green in the pasture or even when dried as hay, will cause massive internal hemorrhaging, sickness or death.

In fact, glaring birth defects in cattle can be produced by feeding cows certain common toxic plants during a crucial period of their pregnancy, thus demonstrating a whole new view of natural nutrition in animals, and perhaps in humans.

The knowledge that toxins pass through the lactating cow (or goat) into milk consumed by humans, is the basis for the strict control of U.S. milk production under the supervision of the Food, Drug and Cosmetic Act.

Snakeroot, a common weed in some parts of the country, helps to demonstrate how serious this pass-through can be. Children drinking milk contaminated by snakeroot become sick, vomit, suffer from headaches and diarrhea, and are subject to serious secondary infections.

The FDA — the Federal Food and Drug Administration — views the possibility of toxic pass-through as being so potentially dangerous that for many years milk has been one of the most closely monitored food substances.

What is lacking

As milk producers, we are under very strict rules applying to chemical contam-

ination. We are not allowed to use the milk of cows under medication, and under the terms of the "Delaney Amendment" to the Food, Drug, and Cosmetic Act, must follow the concept of zero tolerance in milk for any substance considered carcinogenic.

The Delaney Amendment is impractical. The Amendment lacks both in science and logic. The full application to humans of results found in animals, the rejection of substances found in infinitesimal amounts (and which in many cases are a natural part of some human foods) — the rejection of risk-benefit factors — these have produced an unreal law which demands instant and unreal black-and-white decisions.

New "miracle methods" of detection have been perfected since the "Delaney Amendment" was enacted 21 years ago. Now, minute residue particles can be found where none were thought to exist before.

One result was the discovery of minute residues of diethylstilbestrol (DES) in the livers of beef animals, causing a ban on this growth-hormone substance which had been so helpful to the livestock industry. Yet a human would have to eat 5,500 pounds of DES contaminated beef liver daily to ingest five milligrams of DES — an amount which our government considers safe for certain medical treatments.

The banning of any food additive without scientific knowledge whether it might harm a human or not, can only increase public alarm about the seemingly ever-present danger of food-caused cancer.

The role of diet and food additives in the incidence of cancer has been greatly exaggerated in the public mind. Each new scare buries the scientific approach under another layer of emotion.

Common sense will only return with the repeal or amendment of the Delaney provisions of the Food, Drug, and Cosmetic Act to permit setting safe tolerances for additives and chemical residues found in foods.

We desperately need a rational cancer assessment policy, one in which scientific panels lay a sound technological base for scientifically sound regulatory decisions. Only then can an emotionally stirred public relax with full knowledge of sound risk-benefit ratios working in their favor.

Afterall, we must be doing something right in this country, for the incidence of cancer, except that related to smoking,



Few people will buy scabby apples when unblemished ones are readily available. Miticides ensure marketable produce, leave no harmful residue.

has steadily declined even as our national life expectancy continues to rise.

Meanwhile the list of useful chemicals, now restricted or outright banned from further use, continues to grow.

The list includes DDT and such other effective pesticides as Mirex. Included in the family of cyclamates, DES, Red Dye Number 2, and saccharin. Controversy rages over nitrates and nitrites and the recent suspension of 2,4,5-T.

Hidden tax

Almost without exception, politics seem to have overwhelmed economics and the long-term public good.

Reduced productivity and increased costs have become a monstrous hidden tax paid by everyone.

No farm product or food production process remains safe from irrational attack.

Congress must demand that qualified chemists, doctors, nutritional experts, and authoritative scientists from many fields, become involved in chemical safety decisionmaking.

Farm people support reasonable regulation of chemical use, but we plead for balance and full assessment of risks versus benefits.

Farmers are forever asked to produce more food for growing populations here and abroad. We are mindful that many of those who entreat us the most are the most intent on changing the market system under which we produce and live. We must ask ourselves if many of the facets of the environmental issue have not become servants to that end, and something quite beyond the basic equations of chemistry and public safety.

Finally...

Of course, farmers have a side in this issue. But, above all else, it is the people's issue. It can only be resolved by the facts, arrived at objectively and scientifically.

So we lay our case before you. Let the facts take us wherever they will, but let them be facts! This is not the time for emotional role-playing or the familiar courses of activist causes.

What is at stake are the basic resources of this country; and let us turn to the problem with the greatest resource of all — the mind of man. Here is the mind to test and evaluate; to weigh and develop; to think and to discover; to take us where it is wisest for us to go.

And that is why we are so grateful you (the scientists) are here today. □



Without 2,4-D for weed control in grains, experts calculate yields per acre could drop as much as 30 percent and crop quality would suffer. Result: a farm income crisis, higher prices for consumers, food shortages.



Fifty-six scientists from eight nations agree that the herbicide 2,4,5-T is safe

"It is difficult, if not impossible, for those trained in law to understand the nuances and subtleties of science that are so important in the exercise of scientific judgement."

A body of world scientists has agreed that the herbicide 2,4,5-T does not cause cancer, does not induce genetic mutations or birth defects, is of minimal ecological concern, and does not create a hazard through bio-concentration in animals or humans.

The study the U.S. Environmental Protection Agency (EPA) used in suspending major uses of the herbicides 2,4,5-T and Silvex is "seriously flawed", according to a consensus report prepared by 56 scientists who participated in an American Farm Bureau Federation (AFBF) conference on 2,4,5-T last June in Arlington, Virginia. Scientists from Canada, Italy, Sweden, New Zealand, Switzerland, France, Germany and the United States attended. They represented fields of medicine, toxicology, chemistry, ecology and agriculture.

The AFBF-sponsored "Dispute Resolution Conference" — first of its kind — was intended to reach an unbiased scientific consensus on major issues surrounding regulatory decisions on 2,4,5-T. The 56 active participants were divided into six working groups which met for three days to discuss 2,4,5-T carcinogenicity and mutagenicity, teratogenicity (ability to cause birth defects), chemistry, human exposure, ecological effects, and benefits. The reports of the working groups have been assembled into a final conference report. The herbicide 2,4,5-T was selected as the topic for this first conference because it is currently the center

of governmental legislative activity and media attention. The conference co-chairmen were Dr. F.H. Tschirley, Michigan State University, and Dr. T.C. Byerly, former USDA Administrator.

Dr. Fred Tschirley, conference co-chairman, said that the conference represented a method of resolving scientific disputes by bringing together qualified scientists who attempt in public discussions to arrive at a consensus. He contrasted this method with traditional dispute-resolving mechanisms in which scientific issues are resolved by attorneys and judges who must decide between conflicting scientific opinions.

"It is difficult, if not impossible, for those trained in law to understand the nuances and subtleties of science that are so important in the exercise of scientific judgement," Tschirley said.

All conclusions reached represented a group consensus. There were no minority reports filed. Invitations were extended to a wide variety of scientists and environmental groups in many countries but none of the experts among the latter groups accepted or tabled written comments.

A conference working group on human exposure concluded that the data supporting the EPA study of miscarriages among women in the area of Alsea, Oregon, provide "no basis for any significant conclusions." The conferees also concluded that 2,4,5-T has not been shown to be carcinogenic (cancer causing) or muta-

genic (capable of inducing genetic mutations) in animal tests and that no adverse effects on human reproduction have yet been demonstrated.

The major conclusions of the various workshops were as follows:

Carcinogenicity - Mutagenicity

- "2,4,5-T is not a carcinogen nor mutagen in animal test systems studied to date."
- "TCDD is carcinogenic for rats and mice."
- "TCDD is a mutagen in two bacterial reverse mutation systems, but no *in vivo* (in the living body) correlates of mutagenicity have been found."
- "Phenoxy herbicides containing TCDD have not been shown to be carcinogenic in humans in retrospective epidemiologic studies to date."
- "Based upon the most definite animal carcinogenesis study, the working group felt that extrapolation from the high dosages of the test chemical should be made to dosages that might possibly be encountered in the environment during continuous lifetime exposure."

Teratogenicity

Effect of 2,4,5-T on Reproductive Parameters in Animals:

- "A review of early studies in animals revealed that high doses of 2,4,5-T containing 0.1 ppm of TCDD or less produced cleft palate (mouse only) or embryo lethality in a number of experimental species (mouse, rat, hamster,

sheep, monkey, rabbit). A recent three-generation reproduction study in rats was available for examination by this group. Neonatal survival was decreased in a dose-related manner, and the no-adverse-effect dose level in the species most sensitive to 2,4,5-T, the mouse, was 20 mg/kg/day."

Effect of TCDD in Reproductive Parameters in Animals:

- Studies in rats and mice for teratogenic and embryo-toxic effects revealed the highest no-effect dose level in rats to be 0.03 mg/kg/day (teratogenicity). At higher doses, cleft palates, intestinal hemorrhage, kidney changes, or embryofetal lethality was observed.
- "In studies conducted in rats and monkeys, the apparent no-effect level in rats was 0.001 mg/kg/day, a level of 10x below the demonstrated no-effect level in the Rhesus monkeys."

Effects of 2,4,5-T and TCDD on Reproductive Parameters in Humans:

- "Alsea Study — The miscarriages reported in this study were not demonstrated to result from the spraying of the forests with 2,4,5-T."
- "Analysis of available data¹ leads this group to the conclusion that no adverse effects on human reproduction have yet been demonstrated after exposure to 2,4,5-T or TCDD."

Human Exposure

- "Sufficient evidence exists to date to conclude that chloracne in humans is the most frequently manifested consequence of exposures to TCDD and may occur without other evidence of toxicity."
- "The group found no evidence for an abortion-causing effect of TCDD in the human."
- "The group considered the Alsea, Oregon data and reached a consensus that such serious deficiencies existed in the data that no conclusions were possible regarding possible abortifacient effects of 2,4,5-T."
- "In regards to the data on TCDD exposure in Seveso, the group concluded that evidence of no manifest teratogenic effect in Seveso over the time period of observation exists."
- "The group concluded that there was no evidence of an association between birth defects of the neural tube and exposure to 2,4,5-T in either the New Zealand or Victoria, Australia investigations."
- "The group agreed that the available data cannot be interpreted as provid-

ing either positive or negative evidence of a carcinogenic effect in the human."

- "TCDD was not found in the urine of personnel who applied 2,4,5-T sprays in the forest. Based on a TCDD concentration of 0.04 ppm in the formulated product, 2.9×10^6 mg/kg/ work day is the maximum amount that could have been absorbed."

Ecological Effects

- "2,4,5-T *itself*, relative to TCDD as a contaminant, is of minimal ecological concern subject to several qualifications as to conditions of use."
- "TCDD degrades rapidly on leaves, in water, and on the soil surface through the action of sunlight. However, once incorporated in soil, measured half-lives have ranged from one to three years or more."
- "In terms of levels of TCDD entering the top few inches of soil, routine right-of-way applications in the United States represent about 1/13,000th the level of contamination that was initially associated with the Seveso, Italy episode, and about 1/1,000th of that currently remaining TCDD-containing defoliant applications at Eglin Air Force base in about 15 years ago."
- "The highest environmental residues of TCDD from approved 2,4,5-T application that can currently be documented (based on a single sample) is 60 ppt in one beef fat sample."
- "Although the available analytical data provide little evidence that TCDD is accumulating in the environment as a result of normal domestic use of 2,4,5-T, larger numbers of samples must be analyzed with even more specific methods before this can be established."
- "The major area of uncertainty concerns the questions of whether such levels could be expected to result in detectable (immediate or delayed) biological effects. Although no known biological effects in connection with routine 2,4,5-T use have been documented over a 30 year period, we cannot, do not, and will not occur. Expected animal residue levels in right-of-way uses are within two orders of magnitude of levels associated with chronic toxic effects in Rhesus monkeys in long-term feeding studies."

Chemistry

- "It was agreed that no levels of TCDD in the ppm or ppb range have been detected in the environment exclusive of waste disposal or spills. It was fur-

¹Data from the USA, Sweden, New Zealand, Australia, Vietnam and Italy were studied.

A glossary of technical terms and names.

Acute Tests: Those of relatively short duration, but generally of relatively severe stress.

Bioconcentration: The ability of a compound to concentrate in part of the environment, usually in living species.

Carcinogenic: Cancer producing.

Chronic Tests: Those of relatively long duration, with varying degrees of stress, usually chosen to allow animals to live out the long term (1-2 years) of the study.

Dioxins: A family of 75 compounds; the most thoroughly researched is TCDD.

Fetotoxicity: The toxic or degenerative effect on already formed fetal tissue and organs caused by treating pregnant females during the period after tissue differentiation and organogenesis has occurred (after the embryonic stage).

Hazard: The likelihood or probability that injury will occur.

Mutagenic: Inducing genetic mutation (changes in genes).

ppm: Parts per million

ppt: Parts per trillion

Pharmacokinetics: The dynamics of the fate of a chemical in the body. It quantifies as a function of time, the absorption, distribution, metabolism and excretion of materials.

Phenoxy Herbicides: A family of products including 2,4-D; 2,4,5-T and Silvex which selectively control plants by causing malfunctions in growth processes.

Photodegradation: The breaking down of compounds when exposed to light in a particular medium of interest (air or water).

Silvex: 2,4,5-Trichlorophenoxyacetic propionic acid. Manufactured from 2,4,5-trichlorophenol; may contain trace amounts of TCDD.

TCDD: 2,3,7,8-Tetrachlorodibenzo-p-dioxin.

Teratogenic: Causing abnormal embryo development and congenital malformations (birth defects).

Toxicology: A science that deals with poisons and their effect upon living organisms.

Toxicity: Webster defines Toxicity as "the quality, state or relative degree of being toxic or poisonous." It is worthy of note that Webster recognizes a relative degree of toxicity, because this concept is too often overlooked in evaluating "hazard", or the probability of an untoward effect occurring.

2,4,5-T: 2,4,5-T Trichlorophenoxyacetic acid. Manufactured from 2,4,5-trichlorophenol; may contain trace amounts of TCDD.

2,4,D: 2,4-Dichlorophenoxyacetic acid, one of the phenoxy herbicides. Not manufactured from 2,4,5-trichlorophenol; contains no TCDD.

ther agreed that levels at 100 ppt or above have not been detected in any environmental sample associated with the normal use of 2,4,5-T, (i.e., fish, beef or mothers' milk). Below this level, specific substrates and studies must be considered separately:

"Mothers' Milk — Based on three separate studies conducted up to January 1979, no validated TCDD residues above 1 ppt have been detected based on analysis of 44 mothers' milk samples. *There are no confirmed² detected levels of TCDD in mothers' milk.*"

"Beef Fat — Out of 85 samples (including 20 controls) there was only one sample of beef fat confirmed at 60 ppt of TCDD and two apparent but unconfirmed samples at 20 ppt. The remainder of the samples were below the detection limits of 10 ppt. These data were obtained from the EPA 'Dioxin Implementation Plan.' In a separate published study in 1976 by one laboratory, 24 samples of beef fat from animals known to have grazed on 2,4,5-T treated forage were analyzed as a level of sensitivity of 6 ppt.

None of the samples showed a residue of TCDD at or above the limit of detection.³"



"Beef Liver — Of the 43 beef liver samples from cattle grazed on 2,4,5-T treated rangeland (EPA 'Dioxin Implement-

ation's Plan'), no confirmed TCDD residues were present at a level of sensitivity of 4-8 ppt."

"Bovine Milk — One laboratory has reported in the scientific literature a study based on work done in 1974 with lactating cows grazed on 2,4,5-T treated forage. No milk sample from these animals showed a residue of TCDD above the detection limit of 1 ppt.

"Fish — A published scientific report on the analyses for TCDD in fish taken from waters adjacent to areas of regular 2,4,5-T use (in Arkansas and Texas) in 1975 showed no detectable TCDD at a sensitivity of 10 ppt."

"Wildlife — In connection with normal patterns of use of 2,4,5-T, few studies of TCDD residues in wildlife have been done. The largest study used inadequate analytical methodology and did not yield sound quantitative data. A later unconfirmed small study did not detect TCDD in livers of a large

²Confirmed = Detection by more than one laboratory at 2.5 x signal-to-noise ratio using the agreed analytical method.

³A finding of a residue equal to or less than the limit of detection should not be considered positive.

A PRIMER ON THE TOXICITY OF PESTICIDES

The uninitiated often assume, erroneously, that a highly toxic substance means that the material is always extremely poisonous to living organisms under any set of exposure conditions. The science of toxicology is based on the knowledge that this belief is an over-simplification of reality.

Toxicologists know that more than toxicity alone comes into play. They know that the size and duration of the *dose* (i.e., "exposure") of a substance as well as the *route* of dosage (i.e. oral, through the skin, inhalation, etc.), are other factors instrumental in determining how hazardous or poisonous a substance actually is in real life situations.

They know also that every material created by nature or man is toxic to some degree, including water and air.

Moreover, it has been repeatedly shown that some compounds in small doses (either at one time — acute exposures, or over a period — chronic exposures) have no effect, larger doses (acute or chronic) can have very beneficial results, but very large acute or chronic doses of the same

compound can be harmful indeed. This is known as "the fertilizer effect." An example would be aspirin tablets. To be fair, one should understand that science has proven the reverse and variations in this scenario too.

The point is that toxicity, by itself, is a most crude measurement and indicates only *relative* hazard under a given set of circumstances in comparison with other substances.

Lethal dose 50% (LD₅₀)

The accepted method of recording the relative toxicity of a pesticide is the Lethal Dose 50% (LD₅₀) value. This is a statistical estimate of a chemical dose which, when administered, will kill 50% of the test animals under stated conditions. This is the accepted yardstick used to denote hazard, but care must be exercised in its interpretation.

The figures which designate the LD₅₀ values are expressed in milligrams of dose per kilogram of body mass of the test animal. The chemical dose to kill a 2000 pound (900 kg) horse will be about 10 times the same relative dose for a 200 (90 kg) pound foal. For any one group of test animals of the same species, there-

fore, the mass of each animal has to be determined by weighing.

The test animal may be a rat, dog, bird, or fish, but very rarely is LD₅₀ information available for humans. The LD₅₀ values are seriously affected by the age of the test animals and strains of the same species may react very differently to the same treatment. For this reason, the LD₅₀ values developed for one species only begin to inspire confidence after numerous tests have been conducted by many workers under varying conditions. It is because pesticides are selective in their action, and therefore different species of animal life react differently to such a degree, that the compounds are useful. *Thus the LD₅₀ values for rats or dogs may have little bearing on the value for birds, or humans.* Because of this variability, values should be expressed as a range where possible. Nevertheless, LD₅₀ values are very useful in classifying pesticide chemicals according to their toxicity.

Toxicity also varies with the route of absorption into the body. Values may therefore be determined for different routes of administration: the oral, dermal and respiratory routes being of most practical significance.

native rodent species collected in forest spray area."

"Is 2,4,5-T the sole source of 2,3,7,8-TCDD in the environment?"

"No. There are other sources such as combustion of certain chlorinated organic compounds whether in industrial or municipal waste. There are indications that other combustion sources are implicated as well. It is impractical to attempt to eliminate all of these sources at the present time.

Concern has been expressed regarding the persistence of 2,4,5-T and TCDD in the environment. Extensive studies with 2,4,5-T over many years have shown it to break down quite readily. The half-life of 2,4,5-T in soil at normal rates of application will range from two weeks to four months. Temperature, moisture, fertility level, and soil type may modify the rate of disappearance, but the half-life of 2,4,5 T rarely exceeds four months. "TCDD on the other hand, while rapidly degraded by light, appears much more persistent in soil and aquatic systems. At the extremely low concentration

that would accompany the normal application of 2,4,5-T, it is probable that the half-life is not



in excess of one year. However, in laboratory experiments or chemical accid-

ents where greater amounts have gotten into the soil, the half-life appears significantly longer.

One possible explanation of this is that the biological activity of TCDD is so high that at saturation concentrations in soil solutions, the chemical or biological mechanism responsible for its disappearance is inhibited, thus resulting in longer persistence.

Benefits

Given the data available, the majority of the work group concurred with the conclusion that significant losses would occur if 2,4,5-T were not available for use in forestry. Higher costs would occur in the control of brush in rights-of-way and losses in production from pasture and range would result. Given current production practices, losses would be sustained in rice production. However, several members questioned the extent of the rice production losses because of lack of documentation of data and assumptions."□

Ed. Note: Readers can obtain a copy of the 101-page Conference report by writing to us or by writing to the AFBF, 225 Touhy Avenue, Park Ridge, Illinois 60068. There is no charge from either source.

Another way of expressing relative toxicity is employed in the case of fish (and may also be used with birds and wildlife of low body weight). This is the Lethal Concentration 50% (LC₅₀) value expressed as parts per million (ppm). In the case of fish, this value is the ppm of chemical (active ingredient) in the water for a certain period of time (usually 24 hours) which will kill 50%.

Also, an LC₅₀ value in air is used in

connection with the poisoning of mammals by inhalation.

In all cases, the *higher* the value given for LD₅₀ or LC₅₀, the *less toxic* the material.

The following table lists the estimated LD₅₀ values for common household products and some pesticides. Since it is rare to find LD₅₀ data for humans, the figures shown are estimated acute oral toxicities for these products when consumed by laboratory rats. (See footnote 4).

⁴The estimated oral LD₅₀ values of common household products are calculated from the estimated lethal range data of H.C. Hodge and W.L. Downs, *Toxicol. Appl. Pharmacol.*, 3, p. 689-695 (1961). Thus the data here are estimates only. Data for liquids assumes the density of solutions to be 1 gm/cc. Calculations are based on log extrapolation. Avoidupois figures are rounded to the nearest 1/10th pound. Data for formulated pesticide products are derived from Dow literature supported by research conducted by qualified investigators.

⁵Herbicides listed are sold only to qualified applicators. None are available "over the counter" to home gardeners.

Estimated Acute Oral LD₅₀ (Rats)

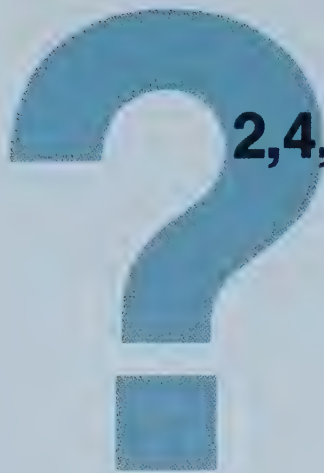
(in grams/70 kg person; lbs/154 lb person in brackets)

Household products:			
Cleaner, window (solution)	1,820 (4.0)	Nail polish, liquid	1,330 (2.9)
Cloves, ground	2,940 (6.5)	Nail polish remover	490 (1.1)
Floor wax, paste	2,240 (5.0)	House paint, white	770 (1.7)
Horseradish, grated, prepared	2,940 (6.5)	Soap, toilet bar	700 (1.5)
Polish, furniture, liquid	2,240 (5.0)	Aspirin (acetylsalicylic acid)	120 (0.3)
Sugar, granulated	1,890 (4.2)	Baking soda	240 (0.5)
Vanilla (extract)	1,820 (4.0)	(sodium bicarbonate)	300 (0.7)
Whiskey (86 proof, blended)	2,240 (5.0)	Table salt	300 (0.7)
Alcohol, rubbing (70% isopropyl alcohol)	490 (1.1)	Formulated herbicides (before dilution prior to field application)⁵	
Bleach, liquid (5.25% sodium hypochlorite)	308 (0.7)	Esteron* 99 Weed Killer (46% 2,4-D)	50 (0.1)
Cleanser, all-purpose liquid	1,330 (2.9)	Formula 40* Weed Killer (40% 2,4-D)	70-140 (0.2-0.4)
Cleanser, powdered	910 (2.0)	Tordon* 22K Weed Killer (21.5% picloram)	720 (1.6)
Cream of tartar	1,050 (2.3)	Tordon* 10K Pellets (10% picloram)	350 (0.8)
Detergent, all-purpose gran.	420 (0.9)	Tordon* 101 Weed & Brush Killer (picloram & 2,4,-D)	210 (0.5)
Gasoline	1,330 (2.9)		

Sample Interpretation:

TRUE: Tordon 22K herbicide, as sold to users and before dilution for use in the field, is about 2½ times less toxic to test rats than table salt, according to single oral dosage tests in the laboratory. Based on these tests and assuming an average healthy adult man would react the same as the test rats, he would be taking a 50% chance of dying if in one sitting he ate about 1½ pounds of undiluted formulated Tordon 22K herbicide or about ¾ pound of table salt.

FALSE: Eating 1½ pounds of Tordon 22K herbicide may (or will) kill you. And eating ¾ pound of table salt may (or will) kill you.



2,4,5-T ... Another decade of controversy?

While 2,4,5-T was being discussed, it was the entire chemical pesticide industry that was being criticized and defended. The lessons learned were relevant to the entire industry as well.

by G.R. Stephenson, University of Guelph

For over twenty years, 2,4,5-T (2,4,5-trichloro phenoxy acetic acid) had been the most important herbicide for the control of woody plants. No other compound possessed the combined properties of broad spectrum systemic activity on most deciduous woody species, selectivity for grasses and conifers to allow uses on rights-of-way and in forestry, high activity as both a foliar spray in water and as a stem-basal spray in oil, moderate to low persistence in soil, safety with respect to humans and wildlife, and low cost. Then in 1969, Dr. Lee DuBridge, Science Advisor to U.S. President, Richard Nixon, announced sharp restrictions of its use and governments around the world did much the same. Even in areas where the use of 2,4,5-T was still allowed, many users, particularly public agencies, switched to other less effective, more expensive, and in some cases more persistent chemicals simply to avoid using, "a chemical as controversial as 2,4,5-T".

The debate over 2,4,5-T has now continued for over a decade and 2,4,5-T has become one of the most controversial pesticides in current use. What are the reasons for this? What are some of the questions? More importantly what are some of the answers? Should 2,4,5-T be banned

or is it safe? Where will the controversy end? The following discussion is an attempt to summarize some of the points that have been made on both sides of the 2,4,5-T issue with particular emphasis on the last ten years.

Effects on non-target vegetation

Since 2,4,5-T and related compounds were introduced in the mid 1940s, users of these herbicides have been aware of hazards by way of drift or volatility to sensitive non-target vegetation adjacent to treated areas. Efforts to minimize the drift problem have in the past been focused on physical modifications of the sprayer and on improving the competence of the spray operator. More recently, advances have been made in the development of additives to reduce the drift potential of the spray solution itself. This has been particularly true for right-of-way spraying (Stephenson *et al.*, 1976; Bode *et al.*, 1976; McNulty *et al.*, 1977). Spray operators are also encouraged to use only low volatile formulations to minimize the risk of vapor drift. It appears that the knowledge and technology are currently adequate to keep drift related problems to a minimum particularly in the large scale state and provincial highway maintenance operations. This applies not only to 2,4,5-T but to spray applications of other herbicides as well.

Alteration of wild life habitats

Some wildlife experts have charged that the control of tall weeds and brush to produce low growing, grassy environments on roadsides has led to reduction of wildlife populations because of habitat destruction (Young, 1968; Kirk, 1969). Others have argued that it is unsafe and detrimental to encourage the development of wildlife habitats closely adjacent to high speed roadways. Still others have

shown that the use of herbicides to maintain clear areas in mature forest stands can be beneficial to wildlife.

In this latter case, the objective is to retard natural succession at the low growing shrub stage or to maintain the "edge effect" which is more productive and more diverse with respect to food and habitats for wildlife (Coulter, 1958). Debates such as this are not likely to be resolved. Suffice to say that any alteration of the vegetation on a roadside, powerline, mature forest, or woodland meadow whether accomplished chemically or mechanically, is likely to discourage some wildlife species and encourage others.

The "nitrate problem"

In her book (Carson, 1962), one of Rachel Carson's criticisms of 2,4-D, 2,4,5-T and related compounds was that they caused higher nitrate levels in injured plants and made the plant tissue more toxic to animals. This claim is quite accurate. There have been reports of cattle deaths after grazing on vegetation recently treated with 2,4-D or 2,4,5-T and post-mortems have confirmed nitrate poisoning as the cause (Fertig, 1952). The apparent sequence of events is as follows: (1) after treatment with 2,4-D or 2,4,5-T, one of the first phytotoxic¹ effects can be an inhibition of the enzyme, nitrate reductase; (2) nitrogen, taken up by the plant as nitrate is not reduced but accumulates as nitrate in the leaf tissues; (3) if cattle or other ruminants feed on the high nitrate vegetation, the microorganisms in the rumen convert the nitrates to highly toxic nitrites; (4) the nitrites in turn enter the blood stream and combine to form methemoglobin;² (5) methemoglobin irreversibly binds oxygen, mak-

¹Toxic to plants.

²Hemoglobin is a protein in red blood cells. It carries oxygen and generally exists in two states. Methemoglobin is one of them.

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Readers who would like a complimentary copy of Dr. Stephenson's book may do so by addressing a request to The Editor, Insight Edition, care of Dow Canada.

Ed. Note: due to space limitations, we could not print a list of references. This extensive bibliography can be obtained by writing to the Editor, Insight Edition.

ing oxygen unavailable for respiration; and (6) if sufficient amounts are consumed the animal can die of anoxia³ within hours (*Hanway et al., 1963*).

It should be noted that herbicides are only one of many causes of toxic nitrate levels in plants. Many weed species and some crops such as beets, sunflowers, or cabbage crops are normally high in nitrates. In addition, sudden drought, frost or sudden temperature changes can result in abnormally high nitrate levels in many species. Thus most cases of nitrate poisoning are due to causes other than herbicides (*Hanway et al., 1963*). Secondly, 2,4-D and 2,4,5-T can actually be used to prevent animal deaths from toxic plants including those high in nitrate. This is a major reason for the use of the herbicides for weed or brush control in pastures or rangelands. To avoid the "nitrate problem" grazing must be prevented until the dead weeds have decomposed. Afterwards, the pasture can be more productive with respect to forage grasses and even safer for grazing because of reduced populations of poisonous weeds.

Direct toxicity to wildlife

Another serious criticism of 2,4-D and related herbicides resulted from a study conducted in France (*Lutz-Ostertag and Lutz, 1970*). These investigators reported that external sprays of 2,4-D at a rate of only 2 lb/acre dramatically reduced egg hatchability in several game bird species. However, in a long series of investigations with very high rates of application at different stages of incubation, Canadian investigators failed to show any detrimental effects of 2,4-D, 2,4,5-T or picloram on game bird eggs or hens eggs (*Somers et al., 1974a, 1974b, 1974c, 1977*).

2,4,5-T as a defoliant in Vietnam

Despite the fact that it had been used for more than twenty years for weed and brush control, 2,4,5-T did not become a "household word" in North America until the mid to late 1960s. At this time its notoriety resulted almost solely from its use in the war between North and South Vietnam. Much of the dissent with respect to the U.S. involvement in this war came to focus on the use of chemical defoliants and other types of "chemical warfare." People in North America were further alarmed to learn that these "dangerous war chemicals" were also being used on "our" crops, roadsides, powerlines, pastures and forests.

The "anti-pesticide" and the "anti-war" movements had an important "common

issue". The controversy became even more heated with press reports of unusual numbers of human "still births" and "birth defects" in the heavily sprayed areas of Vietnam. Then 2,4,5-T became a specific target of the controversy with a report (*Courtney et al., 1970*) that it was teratogenic and caused fetal malformations when fed orally to laboratory rats and mice. Following these reports and allegations, some countries moved to withdraw registration of 2,4,5-T for use "around the home, in aquatic and recreational areas, as well as on food crops" (*CDA, 1970*).

No confirmation

A panel of scientists was established by the National Academy of Science (U.S.) to go to Vietnam and to report on the apparent ecological and health effects of herbicide use by the military (*NAS, 1974, 1974a*). They reported that destruction of crops (260,000 acres), mangrove forests (260,000 acres) and inland forests (2.7 million acres) was enormous. They also reported that regeneration of the mangroves could require 20 years if assisted artificially and as long as 100 years if allowed to occur naturally even though there was little evidence that

Teratogenic potential of 2,4,5-T

After the initial report on 2,4,5-T teratogenicity⁴ in laboratory test animals (*Courtney et al., 1970*) it was revealed that the 2,4,5-T that had been used in the study contained nearly 30 parts per million of a contaminant known as 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). This impurity can arise during production of 2,4,5-trichlorophenol from 1,2,4,5-tetrachlorobenzene used in the manufacturing of 2,4,5-T (*Helling et al., 1973*), if the reaction isn't properly controlled. This contaminant can be present also in other pesticides such as silvex, pentachlorophenol and ronnel as well as in some bactericides derived from trichlorophenol (*Helling et al., 1973*).

In further studies on teratogenicity, Emerson et. al. (1971) established that 2,4,5-T containing as much as 0.5 ppm TCDD was not embryotoxic⁵ or teratogenic with oral doses in rats or rabbits as high as 24 mg/kg/day or 40 mg/kg/day, respectively. In contrast, TCDD was fetidical⁶ when administered to rats at rates as low as 0.125 mg/kg/day (*Sparschu et al., 1971*) and is regarded as one of the most toxic compounds known to man.



Knapweed-free rangeland encourages growth of thicker, more nutritious fodder, permits grazing more cattle per acre, produces better beef. Some weeds can kill cattle but are controlled by pesticides.

herbicide residues in soil persisted for more than a year. However, they failed to confirm or refute the increased occurrence of human birth defects in the sprayed areas. There were apparently too many unusual factors during the war period (some as simple as changes in record keeping in hospitals) to make any conclusions about effects related to the war or the causes.

Further studies have confirmed that "pure 2,4,5-T" is not a teratogen. Malformations can occur in offspring from rats treated with 2,4,5-T but the dose required (100 mg/kg in mice or hamsters) approach

³Deficiency of oxygen in the tissues.

⁴Ability to cause birth defects.

⁵Toxic to embryos.

⁶Ability to be fatal to already formed fetal tissues and organs (after the embryonic stage).

the levels that would cause the death of the mother *Muir and Cunnery, 1971; Collins and Williams, 1971*). After reviewing experimental data, the Environmental Protection Agency (EPA) concluded that "as presently produced and as applied according to regulations in force prior to April 1970, 2,4,5-T represents no hazard to human reproduction" (EPA, 1970).

Most governments have required that 2,4,5-T not contain detectable amounts of TCDD and that analytical tests for purity be sensitive to 0.1 ppm. If all 2,4,5-T contained 0.1 ppm TCDD this would result in about 250 grams of TCDD being applied as a contaminant in the 5 million pounds of 2,4,5-T applied in North America each year. This would be applied over several million acres. Helling et al./1979 examined the sources of TCDD and its fate in the environment. They have established that it can be decomposed in water and soil with about half of it being degraded in one year. It is also very immobile in the soil and it is not taken up from soil by plants to any significant extent.

They expressed concern because of its extreme toxicity and stated that "common sense demands that significant amounts of this contaminant not be allowed to occur in any system". On the basis of their assessment they suggested that with current regulations the amounts likely to be introduced as contaminants in 2,4,5-T or other pesticides derived from trichlorophenol are too low to be regarded as an unacceptable hazard.

2,4,5-T reinstated

These assurances coincided with a reinstatement of 2,4,5-T use by many governments around the world and during the mid to late 1970s the controversy was relatively quiet in many areas. However, it erupted again with the release in 1979 of a study conducted by the EPA in the state of Oregon. A major conclusion of this six-year-long study was that the application of 2,4,5-T in forestry during March and April could be "consistently" correlated with a "June peak" in numbers of spontaneous abortions among women in the study area near Alsea, Oregon. This study is commonly referred to as the "EPA Alsea II Study" and is the basis for the EPA's emergency suspension order on 2,4,5-T use which was issued in February, 1979.

As was the case a decade earlier, there is considerable pressure on other governments at various levels to again restrict the use of 2,4,5-T. However, government-

Six-year comparison of 2,4,5-T treated and untreated areas, Alsea, Oregon

Zip Code	Sites Treated	HSAb ¹
	Fewest Sites Treated	
97397	0	23
97388	0	0
97341	0	3
97369	0	1
97365	0	40
TOTAL	0	67
	Most Sites Treated	
97390	134	3
97343	36	1
97324	224	4
97394	121	10
97439	38	33
TOTAL	653	51

Source: J.W. Witt, Oregon State University, presented at the Jan., 1980 Mtg. of North Eastern Weed Science Society, Grassinger, New York.

¹HSAb = hospitalized spontaneous abortions.

tal action has not been so unanimous this time. In Canada, the federal government has decided that renewed restrictions are not justified but some provincial governments have disagreed and have imposed their own restrictions. This confusion is primarily due to considerable criticism that the Alsea II Study has received.

Many scientific teams have examined the study and have unanimously declared that the "EPA data does not support the EPA conclusions" (Witt, 1980). One prominent critic is James Witt of Oregon State University. He has pointed out that the high numbers of "spontaneous abortions" in the study area during June were not consistent and only occurred once during the six years of 2,4,5-T use. He also noted that both of the "control areas" in the study had at least one "high" month during the six year period. After thoroughly examining the EPA data, he could find no significant difference in the spontaneous abortion rate between any of the three areas examined by the EPA. By obtaining the postal zip codes for the reported abortions, Witt was much better able to segregate the data into groups of women with a potentially high or low probability of exposure to 2,4,5-T than was done by the EPA researchers (See Table).

Even with this more rigorous attempt, there was still no correlation between 2,4,5-T use and number of hospitalized spontaneous abortions (HSAb).

So after more than a decade of research, debate, and controversy — what has been

accomplished? What have been the costs? What have we learned? In terms of the time and money spent by governments, concerned environmental groups and industry to conduct research and to defend their points of view, the costs have been simply enormous. Only a small fraction of these costs can be justified by the economic value of 2,4,5-T, but most participants have realized that principles of great importance to the entire pesticide industry were being debated.

What was accomplished?

At least one major point has been gained from each side of the debate. The experience with the dioxin contaminant has emphasized the need for quality control and the need to examine toxicological effects of possible contaminants just as thoroughly as is required for the principle active ingredient. The highly valid point that has been made by the pesticide industry is that restrictive regulatory decisions by government agencies should be based on sound scientific documentation of a potential environmental or health risk. The preconceived, biased, unscientific but highly publicized Alsea II study is the worst kind of information on which to base regulatory action. Clearly, there is little room for optimism in the pesticide industry if this type of action is not reversed.

As a result of this decade of debate and research, it is safe to say that 2,4,5-T has become one of the most rigorously examined herbicides with respect to toxicological effects on animals and their offspring.

Continued on page 17

Risk and other four-letter words

"Today, we all live in Marshall McLuhan's global village and Chicken Little runs through the square twice a day."

by Walter B. Wriston



Things have changed since the days when the Constitution of the United States was signed. Our forefathers were political adventurers and fighters who did not hesitate to sign a document pledging "our lives, our fortunes and our Sacred Honor" in pursuit of a brighter future against overwhelming odds.

They would have been more than a little surprised to learn that what they were really fighting for was a totally predictable, risk-free society.

Today, however, the idea is abroad in the land that the descendants of these bold adventurers should all be sheltered from risk and uncertainty as part of our natural heritage. We seem to have raised a generation of advocates, writers and bureaucrats to whom the word "risk" is an acceptable term only when used in connection with promoting a state lottery. Emerson's counsel, "Always do what you're afraid to do," is now rejected as too upsetting, and one should steer the safe non-controversial course. One has only to look at the gray stagnation of planned societies where this idea is far advanced to wonder how such a system can continue to attract so much intellectual support. But it does.

Destruction

It can be argued that if the desire to avoid risk above all else becomes the predominant objective of society, it may in the end destroy not only our economic system but our form of government along with it. At bottom, democracy itself rests

on an act of faith, on a belief in individual responsibility and the superiority of the free marketplace, both intellectual and economic, over anything that might be devised for us by a committee of bureaucrats disguised as guardian angels. There is real reason to fear that those who do not share that faith, in their efforts to build a risk-free society, have in fact not only drained the spirit of our people but have already seriously impaired the viability of the most productive economic system that the world has ever seen.

The spirit of optimism and enterprise is being overwhelmed by the unremitting atmosphere of protective custody which now seems to surround us in a new kind of national mood. This is a far cry from the spirit of enterprise that turned a raw continent into a great nation. Today, we all live in Marshall McLuhan's "global village," and Chicken Little runs through the square twice a day.

In times past, ideas spread by pamphleteers and later on in books and by the press. Great centers of learning grew up which refined and nurtured ideas and passed them on from one generation to another. This same function was also performed by the churches. Today, a pop phrase rooted in some private discontent, some transient desire to transfer responsibility for one's own actions to somebody else, or some simple-minded panacea for complex problems, is echoed and re-echoed throughout the land in a matter of minutes on the 6 o'clock news.

The signs carried by a hundred protestors on the site of a nuclear plant may be seen instantly by 50 million people in living color. Contrast the impact of this with the great draft riots in New York in 1863 where mobs ranged over the city for

four days and four nights, looting and burning. It was only on the fifth day that 6,000 federal troops poured into the city and order was restored. Most people living at that time never heard of the incident. One of the so-called "volunteer special" policemen who was involved in the riot said, "No adequate account of the draft riot of 1863 has ever been printed."

Today cameras zoom in on the face of the man struck by the rock or the policeman's club. I do not argue here that this is bad, far from it. But I have to observe that, for the first time in the history of Man, our life with all the flaws inherent in human nature, all the breakdowns in technology, and all of our social foibles is communicated instantly to the world. Things will inevitably go wrong, because men still are not gods. But because all the failures, the mistakes, and the accidents intrude upon our consciousness in an almost unbroken stream, the clamor grows for a fail-safe society.

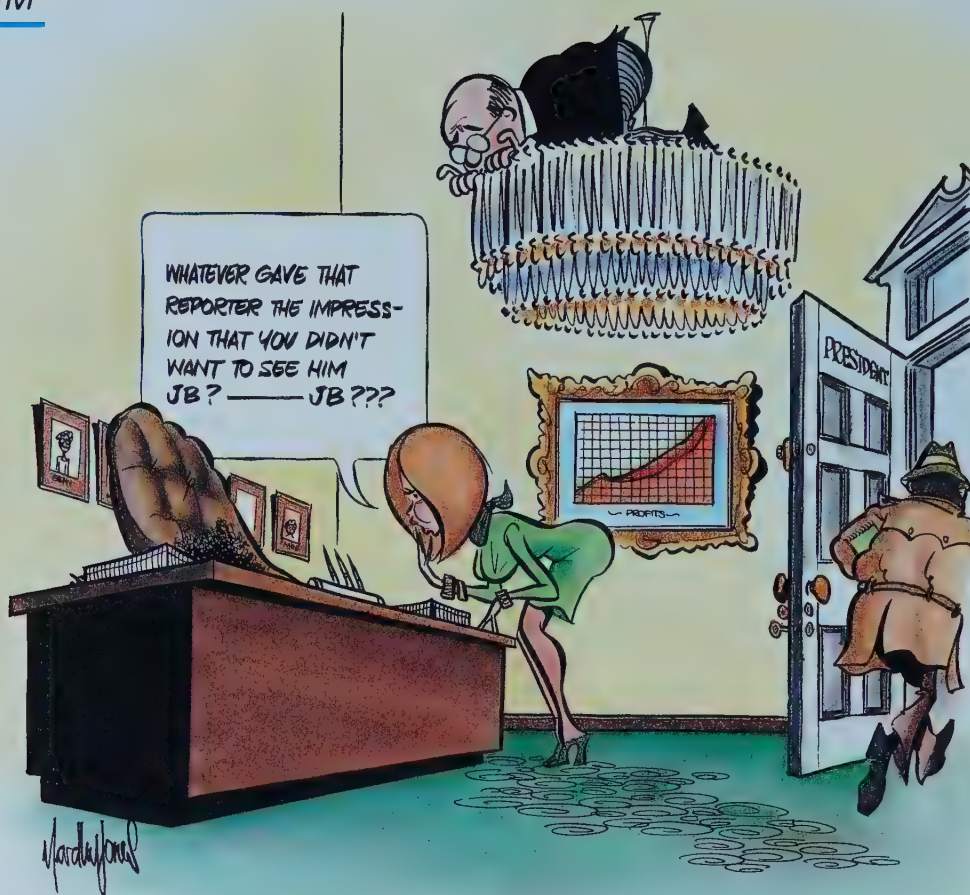
Amazing machine

This growing thirst for an impossible physical and economic security has a direct bearing on whether or not we will maintain our spiritual and political freedom. The relevance of risk to liberty is direct and clear. For in the end, it always turns out that the only way to avoid risk is to leap into the arms of an all-knowing government.

The pattern is always the same. A bureaucracy is put in place to coerce the people into doing something for "their own good." The bureaucracy then assumes a life of its own, and the coercion continues as the bureaucracy's primary task, long after the original purpose has been forgotten.

Continued on page 14

Mr. Wriston is chairman of Citicorp, New York. This is a condensed version of an address he delivered before the Economic Club of Chicago on October, 25, 1979.



Business and the media

by James P. Gannon

"The journalist is coming at the story with an entirely different mental framework, and different goals than the business man would — and I fear that very few people in business either perceive or understand this radically different perspective."

There is little question that newspapers are paying a lot more attention to business these days than they did a few years ago. All across the country; newspapers have expanded their business news departments by hiring more reporters, and devoting more space to business news.

The *Wall Street Journal* ran a front-page story a few months ago reporting the expansion of business news staffs by daily newspapers in the U.S. The *Journal* should know; other papers are raiding its staff of business writers to build up their own. As an editor, I can say from experience that the demand for business reporters far exceeds the supply; looking for a good one can be a frustrating experience.

At the *Register* and *Tribune*, we have been a part of this trend toward greater emphasis on business news. We have

sharply increased and upgraded the business news staff in the past five years, pouring the bulk of our resources into the morning *Register*, our larger paper, which has a statewide circulation.

This expansion reflects the fact that we think business news is important. Both the editor of the paper, Michael Gartner, and I came to the *Register* from the *Wall Street Journal*, so we like to think we know something about business news.

For many years, business news was relegated to the back pages of daily newspapers, buried along with the obituaries and classified ads and considered by most editors to be not as interesting either. Those days are over, at least on the good newspapers.

Business in America is private enterprise, but it is not private in the sense that your business isn't anybody else's

business. Business in this country is dominated by large, publicly held corporations. What those corporations do has a vital impact on the lives of our readers — on their jobs, incomes, home towns, and futures. Business today is licensed, regulated, audited, inspected, overseen but not overlooked by every level of government, not to mention consumer groups, environmental groups, labor unions, do-good organizations, private watchdogs and public inspectors. You may not like it, but that is the way it is today, and that is not likely to change in the future.

The press is not going to go away and leave you alone, no matter how much you might wish for that. As long as you are doing business with the public, dealing with the government, operating plants or offices in the community, the local newspaper is going to want to know what you are up to, and why.

A classic example

Some business people seem unable to understand this or to deal with it. As I was writing this speech, I received an angry phone call from a businessman. He is an official of an Iowa coal company, and he was unhappy to be quoted in a story which told of a revival of Iowa's coal industry. The quote was accurate. I asked him if what he said was damaging to his business. He said no it wasn't damaging but added: "I simply don't like any publicity; we like to keep a low profile; this is a private business."

I expressed some puzzlement at his attitude, wondering how a story telling about the revival of his industry, and the problems it faces with environmental restrictions, could be harmful. It was in one sense, a good-news story; not a scandal, but a story of an industry on the comeback, but one with environmental problems which presumably the coal industry would like the public to understand. And yet, here was a knee-jerk reaction of anger and a wish that his business could remain as underground as a coal mine.

Obviously, we have a problem here. As the theme of this conference suggests, there are barriers of misunderstanding, distrust, suspicion and sometimes downright hostility between the press and business.

Much of the problem, it seems to me, stems from the attitudes of business people toward the press. An interesting insight into these attitudes was given in a project sponsored last year by General Motors Corp. The GM Intercollegiate Business Understanding program asked journalism students at 18 universities and colleges to examine the relationship of business and the media.

One of the participating colleges was Drake University, where a group of students surveyed Iowa journalists and businessmen. I would like to read you a few lines of the summary of the Drake report, as follows:

The Drake team discovered that, while journalists believe they are unbiased against business, the business community is fairly seething with complaints about the press. To some business people, the antagonism boils down to this — business builds up; the media tear down. Com-

ments from business people paint a picture of journalists as voyeurs, preoccupied with the keyhole of corporate boardrooms; as yellow journalists bent on destroying capitalism and the free market; as villains, out to tarnish the reputation of business; at the very least as uneducated schoolboys who inflict damage not out of maliciousness but out of ignorance.

Business' litany of complaints about the media include: (1) the negativism of much of what the media report; (2) the media's failure to provide a more balanced account of business and economic news; (3) incompetence of reporters; and (4) the liberalism of journalists.

The charges

The most serious charge heard from business people is that the press has an anti-business bias. I have heard that one for many years, and, in fact, heard it frequently said of the Wall Street Journal. The complaint normally arises when a newspaper reports a story that casts an industry or a company or an executive in a bad light. Stories of consumer fraud, labor trouble, unethical practices, shoddy products, executive infighting and the sort are likely to be cited as evidence that the newspaper publishing them is anti-business.

I think this perception of anti-business bias stems from a misunderstanding of what the journalist is doing, and his motives for doing it. The businessman looks at a story and focuses on its effects; is this story good for my business, or bad for my business? If it is harmful to his business, the business person tends to assume that the motivation to do damage must be there — otherwise, why run the story?

But, in my experience at least, that isn't the way journalists think, and it is not the way they evaluate stories. Reporters and editors tend to think of the story as an end in itself, not a means to the end. A story is *not* judged by what effect it might have on business — good or bad — but on its intrinsic qualities: is it interesting? is it significant? do many people in our community have some stake in this situation — a job or income or some other pocketbook factor? Journalists don't tend to ask whether this story is good or bad for XYZ Company. We ask whether a story contains fresh or interesting information or insight into a situation many people care about.

You may say we *should* look at the presumed effect before publishing the story.

After all, don't we care about the consequences of our work? Yes, we do care, but our goal is not to have one effect or the other, but merely to publish information and analyze its meaning, and then let the chips fall where they may.

If you think about it, I don't think you'd want newspapers to operate with any other goal. What if we judged political stories by the effects they would have? You wouldn't want us to judge a political story in terms of whether it was good for republicans or democrats, or helpful to the Carter administration, or harmful to Ronald Reagan's candidacy. When you start asking those questions about effects, and basing your editing judgments upon them — then that is where you introduce bias in newspapering.

The honest, neutral newspaperman cannot make judgments based on projected effects of his story. Publishing a "negative" news story about business does not establish an anti-business bias on the part of the newspaper. The journalist is coming at the story with an entirely different mental framework, and different goals than the businessman would — and I fear that very few people in business either perceive or understand this radically different perspective.

A second and related complaint is that the press concentrates excessively on negative stories about business. This, in fact, is the age-old lament about news in general: too much of it is bad news about murder, mayhem, disaster, war, rape and pillage. For business, that translates into too much stress on fraud, scandal, strikes, business failure, conflict of interest.

What they remember

Much of the news is negative, in the sense that it examines society's troubles and woes rather than quiet triumphs or bland normalcy. We report the one airplane that goes down killing 80 people, not about the thousand others that land safely every day. If we ran a story every day saying that 50 airplanes landed safely at Des Moines airport yesterday, how long would it be before you quit reading that story?

So it is inevitable that news will deal heavily with the surprising, the unusual, the threatening and the outrageous aspects of human affairs, including business. Those stories tend to be the ones remembered by business people, especially those pained by them, but they are not by any means the total agenda of our business news coverage. We are just as interested in business success stories and

Mr. Gannon is executive editor of the Des Moines Register and Tribune. This article is a condensation of an address he gave at Drake University in Des Moines, Iowa, on October 24, 1979.

more positive news — if you build a better mousetrap you may discover newspapermen aren't such rats after all.

Business executives also complain that the press is looking for the sensational, prying for scandal. Well, it is a fact that the press plays a watchdog function in our society, and for too long the press was preoccupied with politics and government and crime, and ignored business and economics. We are training our watchdog reporters to sniff around business more these days, because economics dominate the lives of our readers — and business crime, such as price fixing, or consumer fraud, is every bit as important as other crime.

While the watchdog role is an important one for the press to play, it is not the dominant one in covering business. More often we are trying to explain what's happening in the business world — why prices are rising, or product shortages are developing, where employment is growing or shrinking, why one company is succeeding where another is failing. We want to give people information that will help them understand what is going on around them, and information that they can use to make decisions.

In my view, there is one, major overriding problem that unfavorably shapes the relationship of the press and business. And the fact is that most businessmen don't want to have anything to do with a reporter. They do not make them-

selves available to the press and yet later complain that the press does not understand or reflect their side of the story.

Many businessmen are just plain afraid of reporters. They are afraid reporters won't understand the complexities of their business, won't quote them accurately, or will take what they say out of context. They prefer to do what that coal industry official who called me wants to do: that is hide.

But hiding doesn't work. The press will write about your company or your industry whether or not you decide to talk to a reporter. There are plenty of other sources of information — public documents, SEC filings, government reports, officials of business-regulatory agencies, union officials, workers, customers, suppliers, Wall Street analysts. If you let outside sources shape the story, you can't very well complain about the outcome.

Sure, reporters sometimes misquote people, or misunderstand the meaning of some fact or event, or have an insufficient grasp of the meaning of the significance of some business development.

We are human, and we make mistakes, and we often are forced to correct them. This is a fact of life which other institutions seem to be able to deal with more rationally than business. Why is it that governmental officials, politicians, labor union chiefs, environmental activists, social workers and others have a more symbiotic relationship with the press

than business? Is it because their problems are less complex, or that they are more cunning in dealing with newsmen. No, I think not.

I think the difference is that those people have a better understanding of what the press needs and wants, and they recognize that it is in *their interest* to work with journalists, even at the risk of an occasional bruise or bonehead play.

Different goals

Business and the press do not share the same goals, but our differing goals are not mutually exclusive. The purpose of business is to make a profit by providing some wanted product or service. If you do that honestly, within the law and within the bounds of ethics, you have nothing to apologize for, and no reason to be afraid to deal with the press.

The purpose of the press is to inform and to enlighten people on matters that are important to their lives. We have a right, and an obligation, to do that with vigor, to the best of our ability.

Business can't expect to operate in the dark. I think you know this, so perhaps there is a light at the end of the tunnel of business-press relations. Whether that light is the dawn of a new day of understanding — or the menacing headlamp of an onrushing media locomotive — depends largely on how you as businessmen view it. I think we are at least on the right track in talking about the subject.

Letters continued from page 1

may not choose to keep on paying.

4. The Consumer Tax Index was intended to do no more than make the average Canadian family more aware of the cost of government so that their choice could be an informed one.
5. Professor Kesselman's final paragraph reveals an attitude which explains the content within which he views the tax situation. According to him, it doesn't matter that government taxes away income because it gives it back in the form of handouts (transfer payments).

Can we really be unconcerned about how much of our income is passed through government hands? Would Professor Kesselman be as unconcerned if 60 per cent of our income went to government for redistribution? — 90 per cent? — what about 100 per cent? At what point should we be concerned?

I don't know the answer to this question, but I do know that we can't decide until we know how much of our income does go to government — how much tax we really do pay!

I accept Professor Kesselman's point that one could construct other mea-

sures of the cost of government and, in fact, the Consumer Tax Index is only one of many measures presented in the book *Tax Facts*. Moreover, we at the Fraser Institute hope that our "mechanical exercise" (which occupied us for more than a year) will create more interest in taxation issues and perhaps energize people like Professor Kesselman to further expand knowledge in this area.

Thank you for the opportunity to reply.

Michael A. Walker, Director,
The Fraser Institute, Vancouver

Discussion continued from page 13

Although it enjoyed an enviable safety record for over 20 years, the recent requirements for greater purity have increased its safety margin even further, and on the basis of current information, its registration for use as a weed or brush killer should be continued or reinstated.

The public need to know

If more people knew more of these facts about 2,4,5-T, this controversy probably would not continue. If it wasn't so difficult for the press to publish all sides of an issue instead of frequent, short incomplete, and often sensational pronouncements on one side or the other, the

controversy would surely end. When any type of evidence suggests it, we should be continually testing pesticides for possible toxicological and environmental hazard and 2,4,5-T is no exception. However, in the absence of any new facts, further debate on 2,4,5-T is non-productive. Let us not in 1989 and 1990 still be debating the same old controversies about 2,4,5-T. □

Our economic system, like our political system is untidy — it offends those people who love tidy, predictable societies. We make a lot of mistakes in this country, we have a lot of failures. Some people see only the failures; they cannot seem to grasp the fact that the failures are the price we pay for the successes. It's as though they wanted to have "up" without down" or "hot" without "cold."

We read in our newspapers, and even in our business magazines solemn words about "risky investments" and "risky loans" from writers who do not seem to realize that these phrases are as redundant as talking about a one-storey bungalow. All investments and all loans are risky because they are all based on educated guesses about the future rather than the certain knowledge of what will happen. Despite the most sophisticated market research, no one really knows if the public will buy the product or use the service which we are about to produce. The new product might be an Edsel with a \$400 million price tag, or it might be Peter Goldmark's long playing record. It could be the decision of a Joe Wilson, risking all the resources of his small company to make a copier later called Xerox, and doing it in the face of a careful study which showed that it would be a bad substitute for the familiar carbon paper.

The odds against success of any kind in our society are formidable. Some 300,000 businesses are started each year in America and only about a third of them survive as long as five years. Proponents of a safe, stagnant, boring tomorrow view this as a wasteful process, to say nothing of its being irrational.

What was it like?

Our bookshelves today are piled high with books warning us that the pace of change has become too much for human beings to tolerate, that it is not just risk that people fear, but the future itself. We are being overwhelmed we're told by new technology. When we see what the electronic computer has done and is doing to the world, and consider that it was invented in 1946, this argument may seem plausible. But go back a hundred years to 1846 and the argument falls apart.

That was the year Brigham Young led the Mormons out of Illinois on the way to Utah — and coincidentally the year that saw the invention of the sewing machine

and steel moldboard plow. Historians have called the period that began then and lasted to the outbreak of World War I the "heroic age" of invention. From the sewing machine in 1846 to the radio vacuum tube in 1911, a major new invention appeared on the average of every 15 to 18 months, and was followed almost immediately by a new industry based on the invention. That's what the last half of the 19th century was like, but there were few voices then calling "Stop the world. I want to get off."

There were a few, of course. Not long after Lee DeForest invented the vacuum tube amplifier, he was arrested for stock fraud. He'd been going around saying that his service would be able to transmit the human voice across the Atlantic. At his trial, the prosecuting attorney said: "Based on his absurd and deliberately misleading statement, the public, your Honor, has been persuaded to purchase stock in his company."

The jury acquitted DeForest, but the judge admonished him to forget his crackpot inventions and go "get a common, garden-type job and stick to it."

If DeForest were inventing his gadget today, and he could convince people it worked, he might still be in trouble. Before he could go into production, there would probably be a long delay while committees were formed to study the environmental impact of bouncing radio waves off the ionosphere.

The people who insist on seeing only the failures have still another debilitating effect on our society: they frequently manage to make us feel guilty even about our successes.

Prescription for demise

Malaria, for thousands of years the number one killer of human beings, was finally brought under control after World War II by DDT. But instead of hearing about the tens of millions of human lives that have been saved over the past 30 years, we are told about the damage to our natural environment. Concern for the environment is obviously justified, but the highly publicized demonstrations, complete with rock stars and movie actresses, would have us believe that Man, and particularly his technology, is single-handedly polluting what would otherwise be a pure and benign Nature, something like Disneyland on a nice day in September.

Be nice, feel guilty, and play safe. If there was ever a prescription for producing a dismal future, that has to be it. It is

a sure prescription for the demise of our way of life.

It is almost impossible to exaggerate the importance to the general welfare of the willingness of individuals to take a personal risk. The worst thing that can happen to a society, as to an individual, is to become terrified of uncertainty. Uncertainty is an invitation to innovate, to create; uncertainty is the blank page in the author's typewriter, the granite block before a sculptor, the capital in the hands of an investor, or the problem challenging the inventive mind of a scientist or an engineer. In short, uncertainty is the opportunity to make the world a better place. Despite this, everything in our natural life today seems designed to encourage our natural caution, urging us to play it safe, to invent a risk-free system and give up being tough-minded. The tax structure discourages innovators, penalizes the successful, and preserves the inefficient. Even many medicines in common use around the world to prevent human suffering are denied U.S. residents on the slender grounds that an overdosed mouse has contracted a tumor. This is not prudence. Prudence is one of the intellectual virtues, and there is very little intelligence to be found in all this. It is institutionalized timidity, and I submit that it does not represent the will of the vast majority of the people.

Let those who seek a perpetual safe harbor continue to do so. Let them renounce risk for themselves, if they choose. What no one has a right to do is renounce it for the rest of us, or to pursue the chimerical goal of a risk-free society for some by eliminating the rewards of risk for everyone.

The society which promises no risks and whose leaders use the word "risk" only as a pejorative may be able to protect life, but there will be no liberty, and very little pursuit of happiness. You will look in vain in the Federalist Papers, the Declaration of Independence, or the Constitution for promises of a safe, easy, risk-free life. Indeed, when Woodrow Wilson called for "a world safe for democracy," it was left to Gilbert Chesterton to put that sentiment in perspective. "Impossible," he said, "democracy is a dangerous trade." □



Do we know what we are doing?

Discussions about the environment are usually carried on by those who represent the public interest, or the "good guys" vs the group known as "vested interests". There is usually a strong suggestion that the views of the "vested interests" should be disregarded or disbelieved.

But if the views of those who claim to be speaking in the public interest have more validity than the views of the vested interests, let's make sure that all the vested interests are properly identified. The environment industry should come out from behind the bushes, claim its rightful place as "vested interest" and be treated accordingly. It should be considered to be speaking in its own self interest and not the public interest.

The environmental movement has become a rapidly-expanding *industry* consisting of lawyers, planners, scientists, consultants and paid staff members of self-styled public interest groups. Their future prosperity, professional status or job security depend on making never-ending demands for more studies, hearings or regulations, all of which will ensure a continuing demand for their services.

In the United States, the self-styled, public interest advocates are being challenged by the courts. Judges have started asking whether they are really representing the public or themselves. The time is approaching when the same kind of challenge will be heard in Canada.

Public interest groups, when making their demands, usually claim to represent massive numbers of people. Our legislators are encouraged to believe that the worst of all possible fates (i.e. defeat at the next election) awaits any of them who do not support their demands.

Consider Private Member's Bill No. 185 (a bill to provide for certain environmental rights for Ontario citizens) introduced in the Ontario Legislature by Dr. Smith, the Liberal leader. The Bill was given first reading last November 20th. A mere 13 days later the Conservation Council of Ontario wrote an open letter to every member of the Legislature, expressing support for the Bill. The letter said, "The Council, through representatives of its 37 member organiza-

tions, represents over 1 million Ontario citizens."

Let's examine that claim. One of the member organizations is the Ontario Medical Association. I doubt if 1% of Ontario doctors have ever heard of the Council or that the OMA belongs to it. I doubt if a fraction of 1% of the doctors have any real knowledge of the Bill, or that their names are being used to support it. This kind of claim is misleading and should not go unchallenged.

Who really makes the decisions

Many proposals by the environment industry assume that there is such a thing as zero risk, but there never has been and never will be a risk free society. People in any large city risk having their possessions stolen, being trapped in a stalled subway train, suffocating in fires, not to mention dying from alcoholism, tobacco and car accidents.

Those who promote the idea that persons who create the risk should bear the loss would again argue, for example, that it is the oil companies who create the risk of an explosion in the gas tank of your car when they decide to build refineries. But surely that risk was created by society itself when it decided to use automobiles for transportation instead of horse-drawn carriages. Society makes the decisions about the life style we have.

In my experience, industry in Canada is not opposed to reasonable standards for the protection of the environment. The vast majority of business people are good citizens who have no sympathy for those who aren't. The worst difficulties have arisen when the environment industry has taken a very few bad cases and combined them with the zero risk concept and tried to translate the result into the setting of standards and the imposition of responsibilities.

The slogan "Let the polluter pay" has achieved the status of an eleventh commandment. It is indisputably the basis for much of our present and proposed environmental legislation. It is used as an appeal to the emotion and a term of abuse. It has played a key part in the recent discussions of Bill 24 (an Act to amend the Ontario Environmental Protection Act), particularly on the question of absolute liability (i.e. imposing liability under *any* circumstance, including acts of God).

The unintended result

The picture was drawn of the poor, honest, defenseless citizen pitted against the giant, greedy, unprincipled corpora-

tions. The proponents of absolute liability worked themselves into an illogical position. Absolute liability was particularly attractive to them because it could be insured against and the premium costs could be passed on to the customers of the businesses involved. But, isn't that inconsistent with the slogan that the polluter should pay?

The lack of logic of their position escaped the persons advocating it, but the members of the Legislature Committee discussing the Bill saw it. They understood that many small businessmen and farmers would be forced to go out of business or into bankruptcy. Members of the environment industry seemed unable to realize that extreme positions are not likely to be widely supported.

Let me now turn to the Environmental Compensation Fund, under Ontario Bill 24. The provisions for the Fund will almost certainly produce a horrendous mass of regulation and administration. If that will be the result, as I think it will, it is surely reasonable to ask what it is we are trying to do.

It was generally agreed by the Committee that a relatively small number of cases would produce demands on the Fund, but there was a reluctance to get into the question of how much administrative cost would be involved in handling those cases. In other words, would we spend \$2.00 to pay out \$1.00. It is regrettable that we are about to set up another branch of government without sufficient thought.

I don't think there is any real argument among responsible members of society that the natural environment needs protection and improvement. We are arguing about how to accomplish that objective.

I have some suggestions.

1. Discuss environmental issues without creating the good/bad guy syndrome.
2. Accept that we can't have the benefits of technology without the risks.
3. Ensure that industry uses effective commercial technology not untested theories.
4. Develop standards for pollution control based on professional advice rather than a show of hands at a public meeting.
5. Include a cost effectiveness study in environmental legislation and administration to lessen the burden on the public purse.

E. Leonard Weldon, Q.C.

Mr. Weldon is general counsel and corporate secretary for Dow Chemical of Canada, Limited.